FULL-PRÁCTICA-APRENDER 14

viernes, 13 de noviembre de 2020 11:29 a.m.

Determine la ecuación de las asíntotas verticales de la función cuya ecuación es :

$$y = \frac{\text{Senx}}{\text{Senx} - \text{Cosx}} \longrightarrow = 0$$

A) $x = (2n+1)\frac{\pi}{2}$ B) $x = (2n+1)\frac{\pi}{4}$

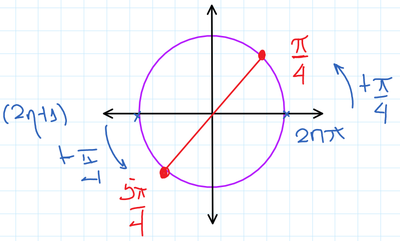
C) $x = (4n+1)\frac{\pi}{2}$ D) $x = (4n+1)\frac{\pi}{4}$

E) $x = \frac{n\pi}{4}$

$\hookrightarrow \text{Sen}x - \text{Cos}x = 0$

$\text{Sen}x = \text{Cos}x$

$\text{Tan}x = 1$



$x = n\pi + \frac{\pi}{4}$

$x = (4n+1)\frac{\pi}{4}$

Dada la función :

$$F(x) = \text{Tanx} + 3\text{Cotx};\ \forall\ x \in \left]0;\ \frac{\pi}{2}\right[$$

determinar el valor de "x" para el cual "F" sea mínimo y hallar este valor

A) $\frac{\pi}{3}$ y $2\sqrt{3}$ B) $\frac{\pi}{6}$ y $\frac{10\sqrt{3}}{3}$

C) $\frac{\pi}{4}$ y 4 D) $\frac{\pi}{12}$ y $2\sqrt{3}+2$

E) $\frac{5\pi}{12}$ y 3

$$\boxed{\hookrightarrow ax + \frac{b}{x} \geq 2\sqrt{ab} \quad \downarrow \quad ax = \frac{b}{x}}$$

$F(x) = 1.\text{Tan}x + 3.\frac{1}{\text{Tan}x} \geq 2\sqrt{1 \cdot 3}$

$F(x) \geq 2\sqrt{3}$

$F_{min} = 2\sqrt{3}$

$1\text{Tan}x = \frac{3}{\text{Tan}x}$

$(\text{Tan}x)^2 = 3$

$\text{Tan}x = \sqrt{3}$

$x = \frac{\pi}{3}$

Hallar el rango de la función:

$$F(x) = \text{Sen}\left(\frac{\pi}{4} - 2x\right)$$

si su dominio es $\left[-\frac{7\pi}{24};\ \frac{\pi}{24}\right[$

A)]1/2; 1] B) [1/2; 1] C) [0; 1]

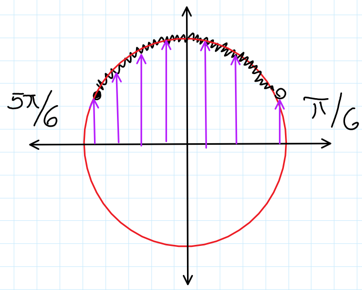
D)]0; 1] E)]1/2; 1[

$-\frac{7\pi}{24} \leq x < \frac{\pi}{24}$

$-\frac{7\pi}{12} \leq 2x < \frac{\pi}{12}$

$+\frac{7\pi}{12} \geq -2x > -\frac{\pi}{12}$

$\frac{5\pi}{6} \geq \frac{\pi}{4} - 2x > \frac{\pi}{6}$



$\frac{1}{2} < \text{Sen}\left(\frac{\pi}{4} - 2x\right) \leq 1$

1. Marcar lo incorrecto :

A) $\text{Dom}(\text{Tan}3x) = \mathbb{R} - \{(2n+3)\frac{\pi}{6};\ n \in Z\}$ $\longrightarrow$ $3x \neq (2n+1)\frac{\pi}{2}$ $\hookrightarrow x \neq (2n+1)\frac{\pi}{6}$

B) $\text{Dom}(\text{Csc}2x) = \mathbb{R} - \{\frac{k\pi}{2};\ k \in Z\}$ $\longrightarrow$ $2x \neq k\pi$ $\hookrightarrow x \neq \frac{k\pi}{2}$

C) $\text{Dom}(\text{Sec}4x) = \mathbb{R} - \{\frac{m\pi}{4} - \frac{\pi}{8};\ m \in Z\}$ $\longrightarrow$ $4x \neq (2m+1)\frac{\pi}{2}$ $\hookrightarrow x \neq (2m+1)\frac{\pi}{8}$ $\hookrightarrow x \neq \frac{m\pi}{4} + \frac{\pi}{8}$

D) $\text{Dom}(\text{Cot}3x) = \mathbb{R} - \{\frac{n\pi}{3} \pm \frac{\pi}{3};\ n \in Z\}$ $\longrightarrow$ $3x \neq n\pi \pm \pi$ $\hookrightarrow x \neq \frac{n\pi}{3} \pm \frac{\pi}{3}$

E) $\text{Dom}(\text{Tan}\frac{x}{2}) = \mathbb{R} - \{(4n+1)\pi,\ n \in Z\}$ $\longrightarrow$ $x \neq (2n+1)\pi$ $\hookrightarrow x \neq (2n+1)\pi$

D) $Dom(Cot3x) = \mathbb{R} - \{\frac{n\pi}{3} \pm \frac{\pi}{3}; n \in Z\}$ ⟶ $3x \neq n\pi \pm \pi \rightsquigarrow x \neq \frac{n\pi}{3} \pm \frac{\pi}{3}$

~~E)~~ $Dom(Tan\frac{x}{2}) = \mathbb{R} - \{(4n+1)\pi, n \in Z\}$ ⟶ $\frac{x}{\cancel{2}} \neq (2n+1)\frac{\pi}{\cancel{2}} \rightsquigarrow x \neq (2n+1)\pi$

2. Calcular el dominio de :

$$F(x) = \frac{1}{Sec^2x} + \frac{1}{Csc^2x} \quad (k \in Z)$$

$x \neq (2k+1)\frac{\pi}{2}$

$x \neq k\pi$

$\cup$

A) $\mathbb{R} - \left\{\frac{k\pi}{3}\right\}$ B) $(4k+1)\frac{\pi}{4}$ ~~C)~~ $\mathbb{R} - \left\{\frac{k\pi}{2}\right\}$

D) $\mathbb{R} - \left\{\frac{k\pi}{4}\right\}$ E) $\mathbb{R} - \{k\pi\}$

$x \neq \frac{k\pi}{2}$

3. Hallar el dominio de la función :

$$F(x) = \frac{1}{Cotx - Tanx}; n \in Z$$

$\neq 0$

$Cot x - Tan x \neq 0$ $Cotx: \exists$, $Tan x: \exists$

$2Cot2x \neq 0$

$Cot2x \neq 0$

$2x \neq n\pi$

$x \neq n\frac{\pi}{2}$

$x \neq \frac{n\pi}{2}$

A) $\mathbb{R} - n\pi$ B) $\mathbb{R} - (2n+1)\frac{\pi}{2}$

~~C)~~ $\mathbb{R} - \frac{n\pi}{2}$ ✓ D) $\mathbb{R} - \frac{n\pi}{4}$

E) $\mathbb{R} - (4n+1)\frac{\pi}{2}$

4. Calcular el dominio de :

$F(x) = \sqrt{Cscx - Cotx}$; $(k \in Z)$

$\geq 0 \rightsquigarrow Csc x - Cot x \geq 0 \rightsquigarrow \frac{1 - Cos x}{Sen x} \geq 0$

$Sen x \neq 0$

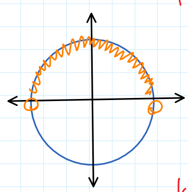
A) $](4k+1)\frac{\pi}{2}; (2k+1)\pi[$ B) $]k\pi; (k+1)\pi[$

C) $]\frac{k\pi}{4}; (4k+1)\frac{\pi}{2}[$ ~~D)~~ $]2k\pi; (2k+1)\pi[$

E) $[\frac{k\pi}{3}; (4k+1)\frac{\pi}{2}]$

$* \; Sen x > 0 \rightsquigarrow 1 - Cos x \geq 0$

$Cos x \leq 1$



$0 < x < \pi$

$* \; Sen x < 0 \rightsquigarrow 1 - Cos x \leq 0$

$1 \leq Cos x$

$Cos x = 1$ $1 < Cos x$

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5. Si : $F(x) = \frac{3Tanx - Tan^3x}{1 - 3Tan^2x}$, determinar el dominio

$\rightsquigarrow F(x) = Tan 3x \rightsquigarrow 3x \neq (2k+1)\frac{\pi}{2}$

$x \neq (2k+1)\frac{\pi}{6}$ ✓

A) $\mathbb{R} - \{(2n+1)\frac{\pi}{9}, n \in Z\}$ ~~B)~~ $\mathbb{R} - \{(2k+1)\frac{\pi}{6}, k \in Z\}$

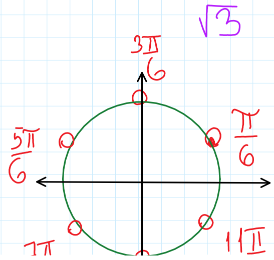
C) $\mathbb{R} - \{(2k+1)\frac{\pi}{18}, n \in Z\}$ D) $\mathbb{R} - \{(2n+1)\frac{\pi}{3}, n \in Z\}$

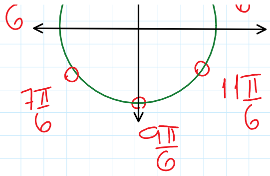
E) $\mathbb{R} - \{(2m+1)\frac{\pi}{12}, m \in Z\}$

$\rightsquigarrow 1 - 3Tan^2x \neq 0$, $Tan x: \exists$

$Tan^2x \neq \frac{1}{3}$ $x \neq (2n+1)\frac{\pi}{2}$

$Tan x \neq \pm \frac{1}{\sqrt{3}}$





6. Hallar el rango de G(x)

$$G(x) = \frac{\text{Cos}^2x}{1+\text{Sen}^2x} \to \neq 0$$

A) [0; 1] B) [1; 2] C) [0; 2]
D) [-1; 1] E) $[\frac{1}{2}; 1]$

$Df: \mathbb{R} \to$

$-1 \leq \text{Sen}x \leq 1$

$0 \leq \text{Sen}^2x \leq 1$

$1 \leq 1+\text{Sen}^2x \leq 2$

$y = \frac{1-\text{Sen}^2x}{1+\text{Sen}^2x}$

$y = \frac{2}{1+\text{Sen}^2x} - 1$

$1 \geq \frac{1}{1+\text{Sen}^2x} \geq \frac{1}{2}$

$2 \geq \frac{2}{1+\text{Sen}^2x} \geq 1$

$1 \geq y \geq 0$

7. Determinar el rango de la función :
F(x) = Cos^2x - 6Cosx + 2

A) [-1; 1] B) [-4; 8] C) [-3; 9]
D) [-6; 9] E) [-3; 6]

$\to y = \text{Cos}^2x - 6\text{Cos}x + 3^2 + 2 - 9$

$y = (\text{Cos}x-3)^2 - 7$

$-1 \leq \text{Cos}x \leq 1$

$-4 \leq \text{Cos}x - 3 \leq -2$

$4 \leq (\text{Cos}x-3)^2 \leq 16$

$-3 \leq (\text{Cos}x-3)^2 - 7 \leq 9$

8. Dadas las funciones :

$f(x)=1+\text{Sen}^3\left(\frac{x}{2}\right)$ $\to$ $-1 \leq \text{Sen}^3\left(\frac{x}{2}\right) \leq 1 \rightsquigarrow 0 \leq f(x) \leq 2$

$g(x)=2\text{Cos}^5 2x+1$ $\to$ $-1 \leq \text{Cos}^5 2x \leq 1 \rightsquigarrow -1 \leq g(x) \leq 3$

$h(x)=3\text{Cos}^4x-2$ $\to$ $0 \leq \text{Cos}^4x \leq 1 \rightsquigarrow -2 \leq h(x) \leq 1$

hallar : Rf ∩ Rg ∩ Rh

A) [-1; 0] B) [0; 2] C) [-1; 1]
D) [0; 1] E) [1; 3]